February 22, 1967

SUMMARY OF GROUNDWATER CONDITIONS AT FIVE CITIES IN NORTHERN ILLINOIS

by

Ellis W. Sanderson, Assistant Hydrologist

This summary of the availability of groundwater for an industrial supply in the vicinity of Joliet, Morris, Ottawa, Henry, and Fulton is prepared at the request of Mr. Dick Dandurand, Department of Business and Economic Development, 30 North LaSalle Street, Room 808, Chicago, Illinois 60602.

JOLIET, WILL COUNTY

Large groundwater resources in this part of Will County are developed primarily from the shallow dolomite formations of Silurian and Ordovician age and from the deep-lying Cambrian-Ordovician aquifer, of which the Glenwood-St. Peter and Ironton-Galesville sandstones are the most productive formations.

Wells tapping the shallow dolomite aquifers in the Joliet area range in depth from around 250 to 450 feet with the nonpumping water levels varying with topography but generally about 50 feet below land surface. Studies of shallow dolomite wells in western Will County show that the median specific capacity of individual wells is about 5.5 gpm/ft (yield per foot of drawdown), although specific capacities may range from less than 0.1 to more than 200 gpm/ft. Individual well yields range from near zero to around 500 gpm depending on the number, size, and degree of interconnection of the water-bearing openings intersected by the bore hole.

Water from the shallow dolomite aquifers is fairly highly mineralized (500 to 1200 ppm) and very hard (300 to 1000 ppm).

The Cambrian-Ordovician aquifer is the principal aquifer tapped for large groundwater supplies in the Joliet area. The primary water-bearing units of the aquifer are the Glenwood-St. Peter and Ironton-Galesville sandstones. Wells tapping the Cambrian-Ordovician aquifer in the vicinity of Joliet generally range in depth from about 1600 to 1700 feet. Nonpumping water levels are between about 0 and 50 feet above sea level (about 600 to 700 feet below land surface) and declining at a rate of about 12 feet/year. Studies of yields of deep sandstone wells in northern Illinois indicate that the deeper Ironton-Galesville sandstone is about three times as permeable as the upper Glenwood-St. Peter sandstone, and that wells penetrating the entire thickness of the Cambrian-Ordovician aquifer generally have specific capacities (yield per foot of drawdown) about 5 times greater than specific capacities of wells finished only in the Glenwood-St. Peter sandstone. The specific capacity of deep sandstone wells in the Joliet area is about 6.5 gpm/ft. Individual wells are pumped at rates from about 300 to 1000 gpm.

Water from the deep sandstones at Joliet is generally hard (250 to 300 ppm) and moderately mineralized (450 to 600 ppm).

The practical sustained yield of the deep sandstones in northeastern Illinois has been exceeded in recent years and the future cost of pumping water from this aquifer system will increase as water levels continue to decline. For this reason it is suggested that if possible, the industrial wells be completed in the shallow dolomite rather than the deep sandstones.

MORRIS, GRUNDY COUNTY

Available information indicates that in the vicinity of Morris large quantities of groundwater are generally obtained from the deep-lying Cambrian-Ordovician aquifer system. The municipal wells at Morris tapping the full thickness of this aquifer are about 1450 feet deep. The piezometric surface is near an elevation of about 450 feet above sea level (about 70 feet below ground level in Morris) and declining at a rate of about 4 to 5 feet per year. The specific capacity (yield per foot of drawdown) of a well tapping the Cambrian-Ordovician aquifer should be about 7 gpm/ft; a well tapping only the Glenwood-St. Peter sandstone should have a specific capacity of about 2 gpm/ft. Individual municipal wells at Morris tapping these aquifers are pumped at rates of 450 to 1000 gpm.